POPULAR MECHANICS

An Illustrated Weekly Review of the Mechanical Press of the World

TELLS YOU HOW TO DO THINGS. WRITTEN SO YOU CAN UNDERSTAND IT

Vol. 1, No. 20. CHICAGO, MAY 24, 1902. PRICE 5 CENTS.

WORLD'S LARGEST ANCHOR FORGED

Weight 16,500 Pounds; Length 15 Feet; Built at U. S. Navy Yard

IN THIS ISSUE:

Nicaragua a Volcanic Center.
How Volcanoes are Formed.
Effects of Lights on the Eye.
A Photometer.
How to Make a Telegraph Instrument, Part 2.
A Fishing Semaphore.
Growing Fruit for Uncle Sam.
Shop Notes.
To Detect Working of Check Valves
Victims of Lightning's Might.
Electric Railway to Use 32,000 Volts.
Electric Cannon May Revolutionize Warfare.
Thought He Had Rabies, and Died.
Steam Boiler Incased in Oil.

Sixty-two Articles—26 Illustrations.

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NEWSDEALERS SEE PAGE 320.

FOR SALE BY ALL NEWSDEALERS.

GREAT ANCHORS BEING FORGED AT CHARLESTON YARDS

To Be Held by Monster Chains, Each Link Weighing 60 Pounds and Standing a Strain of 438,000 Pounds.

> Editor Popular Mechanics: We are now making twenty-two of these great anchors, each weighing 16,500 pounds, but will make more as large ships are appropriated for by congress.
>
> One of these anchors will hold the largest warship, under ordinary circumstances. Respectfully,
>
> E. X. MOORE.
>
> Commander, U. S. N. Equipment Officer.

An anchor weighing 16,500 pounds and costing $2,000 for material and construction, has just issued from the forge at the United States Navy Yards, Charleston, Mass. It is the largest anchor ever made in the history of the world, and its forging, prior to the actual accomplishment of the remarkable feat, was regarded as an impossibility. It is made of wrought iron. Five men hammering, smelting and welding worked on it every day for more than a month.

The one anchor that has just been forged, illustrated on the front page, is for service on the United States Battleship Maryland. It is one of twenty-two of like enormous proportions that have been ordered by the United States navy at a cost of $44,000. It is 15 feet long, and 11 feet wide—from one arm point to the other. The shackle at the weakest point is tested to stand a strain of 1,700,000 pounds.

The largest chain ever made in any land in any age is required to hold this ponderous mass of iron. The links of the chain are 2⅝ inches in diameter and each weighs more than 60 pounds and is tested to a strain of 438,000 pounds. A gang of men work a half hour in the welding and smelting necessary in joining each link. There are to be two anchors on each ship and each anchor will require 2,160 feet of this enormous chain. The anchors are for battleships of the Virginia class and cruisers of the Pennsylvania class, which are now being built.

HOW VOLCANOES ARE FORMED.

They Are Tremendous Explosions of Steam—Time to Fly When the Dust Comes.

By Professor Shaler of Harvard University.

Volcanic outbreaks are merely the explosion of steam under high pressure—steam which is bound in rocks buried underneath the surface of the earth and there subjected to such tremendous heat that when the conditions are right its pent-up energy breaks forth and it shatters its stone prison walls into dust.

The common belief is that the water enters the rocks during the crystallization period, and that these rocks, through the natural action of rivers and streams, become deposited in the bottom of the ocean. Here they lie for many ages, becoming buried deeper and deeper under masses of like sediment, which are constantly being washed down upon them from above. This process is called the blanketing process. Each additional layer of sediment, while not raising the level of the sea bottom, buries the first layer just so much deeper and adds to their temperature just as does the laying of extra blankets on a bed. When the first layer has reached a depth of a few thousand feet the rocks which contain the water of crystallization are subjected to a terrific heat. This heat generates steam, which is held in a state of frightful tension in its rocky prison. It is at these moments that volcanic eruptions occur. They occur because of wrinkling in the outer crust of the earth's surface—wrinklings caused by the constant shrinking of the earth itself and by the contraction of the outer surface as it settles on the plastic center underneath. Fissures are caused by these foldings, and as these fissures reach down into the earth the pressure is removed from the rocks and the compressed steam in them, and there is an explosion of tremendous force. The rocks containing the water are blown into dust, which sometimes is carried so high as to escape the power of the earth's attraction and float by itself through space. After the explosions have occurred lava pours forth. This is merely melted rock, which overflows like water from a boiling kettle. But the explosion always precedes the flow, and one will notice that there is always an outpouring of dust before the lava comes.

NICARAGUA A VOLCANIC CENTER.

Will nature solve the problem of a water way connection between the Atlantic and Pacific oceans? As startling as this proposition may seem, it is by no means beyond the range of possibilities, for in one mighty convulsion of nature an upheaval of the land extending over many miles would be followed by a depression, in which mountains, plains and valleys would recede and inflowing waters of two oceans would complete the work. It it not to be supposed that the clear water way would remain the entire distance across the Isthmus for there would be projecting peaks and reefs and scattered islands characteristic of other chains of islands existing today, and which are positively of volcanic origin. Because such disturbances have not occurred to any great extent for so long a period of time is no reason why we should conclude they have definitely disappeared. The ocean map is dotted with isolated islands, some of them rising abruptly out of several thousand feet of water and, as in the case of the Azore Islands, bearing on their surface lofty mountains, in the summit of which are the extinct craters of what were once active volcanoes. There is much to indicate that a great subterranean artery miles below the surface of the earth, like a vast river of molten rock and metal and highly combustible chemicals, extends in a westerly direction from the present scene of volcanic outbreak. Nature in these outbursts naturally seeks the point of least resistance. We have reason to believe that the earth's crust in the Nicaragua country is comparatively thin and it is at such points like the thin plates in a steam boiler that give way with terrific force when least expected.

Within comparatively recent times small volcanic islands in the Pacific have suddenly disappeared. Nicaragua is in the heart of a zone of volcanic conditions and is the remaining ridge of a vast territory which subsided and allowed the waters of the ocean to overflow it. Stupendous as is the undertaking for engineering skill to remove the present barriers between the Atlantic and Pacific oceans, it requires no great stretch of the imagination to think of the pent up forces of nature in one tremendous effort breaking down these barriers.

EFFECTS OF LIGHTS ON THE EYE.

Bright daylight, without the direct illumination of the sun, is the best illumination for the eye, says Dr. Frank Allport, professor of diseases of the eye and ear at the Northwestern University. Therefore a north window is to be preferred and is usually chosen by dentists, artists and others doing fine work. In reading, and especially in writing, painting, etc., the light should come from the left. The best artificial illumination is the one which most nearly simulates daylight. Perhaps a large student's lamp with a green and white shade, is as good as can be used. A gas drop light with a green and white shade makes a good reading light. The Welsbach droplight, unless properly controlled, is intense, but when controlled by a white chimney and a green and white globe, it makes a good form of illumination. The electric drop light should also be similarly controlled. Reading in carriages, cars, etc., is obviously injurious, as the jolting of the vehicle necessitates a constant changing of the focus and an unsteadiness of the page which necessarily taxes the eye to an extreme degree.

A factory is to be started in Philadelphia for making cloth, resembling silk, from wood pulp.

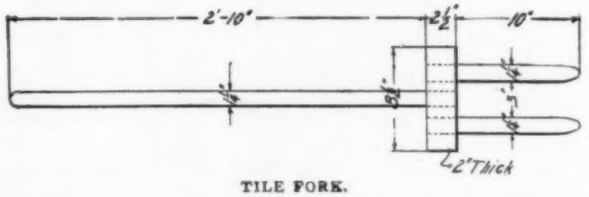
THE AUTOMOBILE KING OF VEHICLES

Extremes in style of vehicles are represented in the illustration below. The one-horse chaise is now seen only in the rural districts and will soon be a thing of the past. The automobile is the vehicle of the new century and while it has been the conveyance of fashionable people for several years past it seems to have only begun its successful career. The day of the chaise has ended; that of the automobile has just begun. The Motor Age, a recognized American authority, says: The rapid increase in the automobile business is strikingly illustrated by the present crowded condition of the prominent factories. Business was increasing rapidly before the late show, but the army of purchasers that made its appearance at that time, and since, piled up orders to such an extent that few makers are in a position to do anything but make promises of future deliveries, a condition not at all satisfactory to the people who are willing and anxious to spend their money.

The Old Century and the New.

FORK FOR LOADING SMALL SEWER PIPE.

A handy tool which greatly facilitates the handling of tile pipe is described in Brick. No gloves are required and the work is made much easier. The head is 8½ inches long by 2½ inches



TILE FORK.

wide by 2 inches thick, and has two prongs set 3 inches apart; the prongs are 10 inches long from point to head and 1¼ inches thick. The handle is 1¼ inches thick and 2 feet 10 inches long from the end to the head.

HOW TO GET RID OF MOSQUITOES.

A scientist who took a mosquito census of a half barrel of rain water counted, as the result of one hatch, more than 17,000 insects. A female mosquito lays 200 eggs at a time, and the young pass through the various stages and become full grown mosquitos in from three to ten days.

There are several ways by which war against mosquitoes may be successfully waged. According to Outing, the best method is to drain the swampy regions in which the insect breeds, but where this cannot be done a small quantity of kerosene oil will remedy the nuisance. When a thin film of oil is distributed over the surface of the water it seals up the young mosquito's breathing funnel, causing death. If people living in country places, or those camping out, even where there is no stagnant water, will see that every open receptacle, tub or barrel is treated once or twice a month with a spoonful of kerosene, they will relieve themselves of much misery. When stagnant ponds are treated in this manner, the treatment being repeated once in every twenty days, in order to catch each succeeding generation, life in the neighborhood may be made bearable, where once it was a burden. The people in an entire neighborhood may be very miserable from one small breeding place and they may be made correspondingly happy by the use of the oil. It is estimated that an ounce of oil is enough for fifteen square feet of surface.

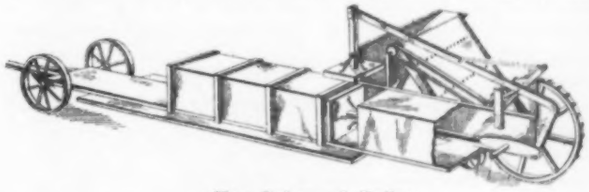
SCRAP TIN TO FEED A BIG INDUSTRY

Detinning of tinplate scrap is going to be an important industry in Toronto, Can., several firms already being engaged in the business. The Canadian Manufacturer says:

Formerly tin scrap, old cans, etc., were treated in a crude way, which removed part of the solder and some of the tin, but the old iron remaining was not fit for remelting in open-hearth furnaces, owing to the tin still adhering to it. This material was used in making cast sash weights, etc., but the product was of a very poor quality, being very brittle. Improved methods have resulted in removing most of the tin coating from the sheets, the remaining scrap being of a very fine quality of steel or iron and valuable for use in the open hearth steel process.

COMBINED HAY RAKE AND BAILER.

The concentration of operation is extending to the farm. A man in Texas has invented a combined hay rake and bailer which



Hay Rake and Bailer.

is intended to bale the hay as fast as gathered. The machine is carried on four wheels and drawn by one team. In the cut a portion of the apparatus is removed to show the interior.

The mammoth heating plant now being installed in the University of Chicago will have cost $360,000 when completed.

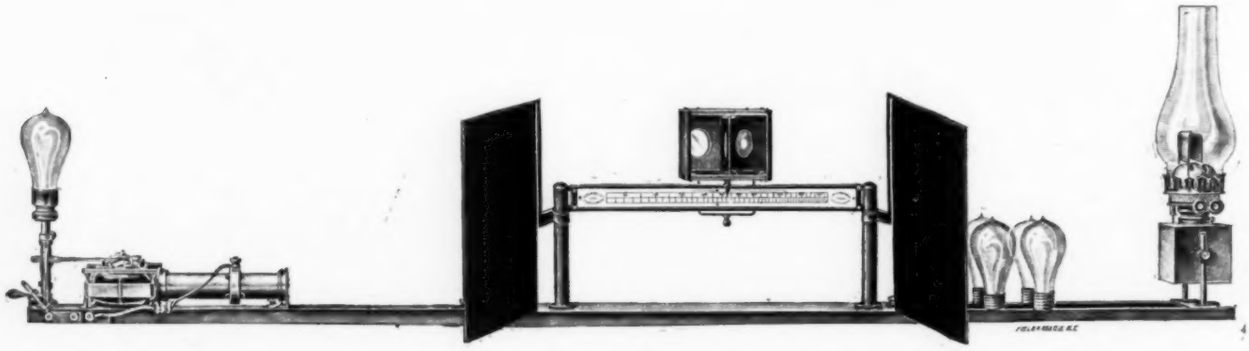
Lake Michigan will probably be dotted with row boats this summer as it is said an effort is being made to revive interest in the once popular sport.

PHOTOMETER—A MACHINE TO TEST ELECTRIC LIGHTS.

A photometer is an instrument by means of which the volume of light produced by any illuminant is ascertained. The operating principles of this instrument are based upon the well-known law that the "intensity of light varies inversely with the square of the distance," and may be briefly described as follows:

At one end of a table from five to ten feet in length, is placed what is known as a "standard unit of light"—a light the exact brilliancy of which at its source is definitely known. At the opposite end of the table is placed the light to be measured, the exact distance between the two lights being carefully measured. If the light from both the known and unknown illuminant balances at a point exactly midway between the two lights, it is evident that both lights are of the same intensity, consequently, by placing a properly graduated scale between the known and unknown lights, it is merely a question of determining the exact spot at which the intensity of both lights balance, in order to ascertain accurately the intensity or value of the unknown illuminant. This is done by means of what is called a "screen" tained that he ascertains the electrical energy required to produce a given amount of light from his lamp. An incandescent lamp, though simple in appearance, is a very complex product, and unless thoroughly understood and properly used cannot be made to give good service. For instance, if too much electrical pressure is given the result is to break down the delicate filament inside the lamp bulb and the lamp becomes worthless. The first external indication of too high pressure is an increase in the brilliancy of the light produced, hence, a photometric measurement becomes absolutely necessary as enabling the manufacturer of the lamp to properly mark his product, indicating the exact voltage or pressure of current which it is safe to give to the lamp.

As an incandescent lamp if improperly made will consume more electrical energy than one properly made, and as the economical properties of an incandescent lamp depend entirely upon the amount of electrical energy required to produce a given amount of light, it becomes advisable that users of quantities of incandescent lamps should possess a reliable photometer, which in conjunction with instruments for measuring the amount of



Photometer Machine for Testing Lights.

which is arranged to move freely back and forth between the two lights.

There are several types of photometer screens that may be employed, but the simplest and most common form is what is called a "Bunsen" or grease spot screen. This consists of a samll black box opened in front and at both ends. In the center of this box, and at right angles to the horizontal plane of light, is placed a metal frame supporting a small sheet of drawing paper, in the center of which has been placed a drop of melted paraffine wax. When the superfluous wax is scraped off a small semi-transparent spot is left on the paper. If the light on one side of this spot is stronger than on the other, the grease spot appears bright on the side from which the weakest light comes and dark upon the other side. It is only necessary to move the screen box containing the spot back and forth between the known and unknown illuminant until both sides of the grease spot appear of equal brilliancy (or the spot practically disappears), to ascertain the point at which the two lights exactly balance—the rest is merely a question of noting the distance of the spot screen from the standard unit of light, as instantly given upon the graduated scale before referred to, from which data can be quickly ascertained the value of the unknown illuminant. In order that the operator may see both sides of the spot card when determning the difference in brilliancy on each side of it, two small mirrors are arranged at the back of the screen box at such an angle that they clearly reflect the grease spot from both sides.

Since the introduction of electric lighting the importance of photometric measurements have become more of a necessity than before that time, when a photometer was regarded purely as an instrument for scientific research. To the manufacturer of incandescent lamps photometric tests of his product are an absolute necessity, as it is by means of the information thus obcurrent consumed by the lamp at a certain voltage, will enable them to ascertain exactly the efficiency and quality of the lamps which they use, so that if the product of one manufacturer of lamps is not entirely adapted to the requirements of the case, the proper steps may be taken to secure a lamp that is more nearly as desired.

Photometers adapted strictly to laboratory uses have always been expensive, costing from $150 upwards. Moreover, these instruments always had to be used in a dark room.

We illustrate a photometer made by the Electric Motor and Equipment Co., Newark, specially for commercial use, and which is simple and inexpensive. In this device two large kerosene burners are used, the oil flames being "set" by a carefully tested incandescent light which is then turned out. This standard lamp lasts a long time.

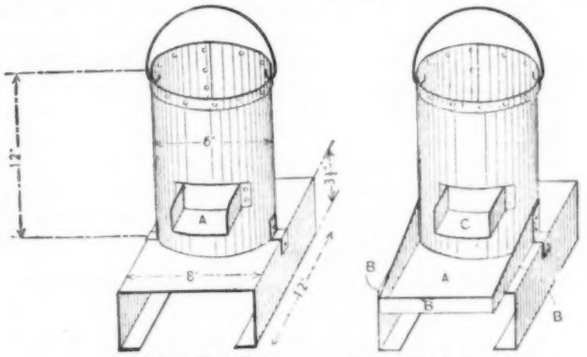
"BURNING OF JUDAS" IN MEXICO

A curious feature of Holy week in Mexico is "the burning of Judas." Images of Judas Iscariot, made in every form and size, are sold about the city. Large ones, made of papier-mache, are fitted with fire works and suspended above the street by ropes, stretched from window to window. Attached to the images are edibles and presents for the crowd below. When Judas explodes or is burned up there is a great scramble for the good things that fall.

Capt. Washington Hight, 70 years old, has spent his entire life since a small boy in service on the Mississippi river and is probably the oldest river pilot in America. He knows every foot of the great old river as well as every boat and boatman that travel the stream.

SAFETY FIRE POTS

In its tin shop hints the Metal Worker illustrates a safety device for use on jobs away from the shop. Often when withdrawing a soldering copper hot coals fall out and may cause fire.



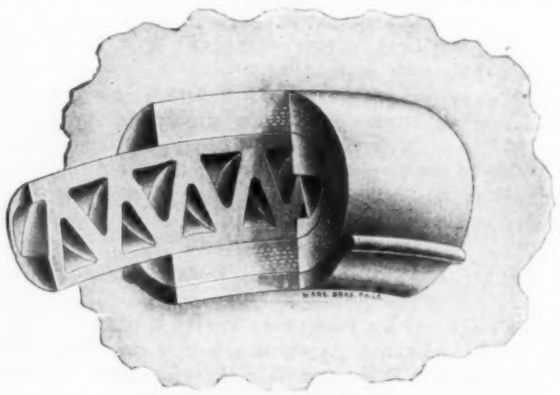
Ordinary Fire Pot. Pot with Safety Pan.

This can be prevented by putting a safety pan under the soldering copper support C, as shown by A, with a ledge bent around the three sides, as shown by B. Then if any hot coals should fall out they will be caught in the pan A and much danger and trouble avoided.

NEW TIRE FOR AUTOMOBILES

Something new for automobiles has made its appearance in a resilient tire that is neither pneumatic nor rubber, but superior to either, according to the claims of its manufacturers. It is called the Beasley elastic tire and is made by the Standard Anti-Friction Equipment Company, 50 Broadway, N. Y. These are among the claims that are made for it:

The tire eliminates the expense and annoyance of repairs incident to all pneumatic tires, and will wear three times as long; it is constructed on the principle of a truss bridge and is therefore strong, durable and resilient; the uncertainty and danger from puncture in the case of pneumatic tires is dispensed with in the Beasley tire; it possesses every advantage over the solid tire which can be made neither resilient nor elastic without sacrificing its wearing qualities.



Latest Auto Tire.

John W. Gates, the steel magnate and stock operator, has been elected member of the Chicago Board of Trade.

The French steamship line, Compagnie Generalt Transatlantique, has joined the Morgan Ocean combine.

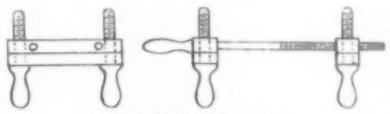
A Marconi wireless telegraph station is to be established at Sagaponack, L. I., and will probably be the central station of the United States.

RECORD RUN ON THE LAKE SHORE ROAD.

Officials of the Lake Shore and New York Central railroads made a record run between Buffalo and Cleveland recently, covering the distance of 183 miles in 180 minutes. The trial of speed, it is said, was to determine upon the practicability of an 18-hour train between Chicago and New York daily. The officials are satisfied with the experiment and believe that a through train between New York and Chicago can be maintained at a speed equal to that of the Empire State Express between Buffalo and New York.

HANDY BELT CLAMP

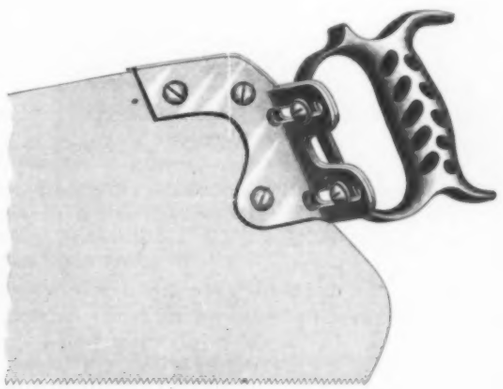
A wooden belt clamp which can be made by anyone having a wood screw box and tap is described in the Wood Worker. It is very handy in splicing new belts, and old ones can be mended without removal from the pulleys. The writer says: "An 8-inch belt is about the limit of its use, although if you have 1⅛-inch good hickory screws, and leave the handles flat, you can turn them up with a wrench for a pretty stiff pull. I have two clamps, one for wide belts and the other for narrow, with screws long enough so that I can make a glue splice between the jaws when desirable."



Home-Made Belt Clamp.

ADJUSTABLE AND DETACHABLE SAW HANDLE

A saw with an aluminum adjustable and detachable handle is manufactured by E. C. Atkins Co. The handle may be moved to a less or greater distance from the saw blade by simply loosening two screws. The flush aluminum detachable handle, made by the same company, is said to be the only handle that can be used for flush sawing, such as cutting studding close to a floor, without danger of skinning the knuckles. The right-hand side of the handle is made flush with the saw.



This Saw Handle Easily Removed.

George C. Hale, chief of the Kansas City fire department, which under his tutorage became the most famous fire team of the world, has been removed by Kansas City's mayor for political reasons, after a service of more than 30 years. Chief Hale and his team honored American firemen in Europe wherever the company exhibited their skill, amazing the European firemen. Every fire company in America and probably in the world has profited by Chief Hale's inventions, among which might be mentioned the swinging harness and the Hale tower.

Easy Electrical Experiments
FOR BOYS

By L. P. Dickinson

CHAPTER XX.

HOW TO MAKE A TELEGRAPH INSTRUMENT.—PART II.

Having made the coils and mounted them upon the base board as explained in the preceding chapter, the next thing to be done is to make the armature, or moving part, by which we can read the messages.

Cut a piece of wood of the shape shown at R in the accompanying figure. It is ⅜ inch square, and 2⅛ inches long. At one end fasten two pieces of thin brass or iron ⅜ inch wide and 5/8 inch long. These should project ¼ inch beyond the end of the piece of wood. Before fastening them to the wood, punch two small holes through them near the projecting ends. These pieces of metal are to serve as a sort of hinge, so that when a small nail is pushed through these holes, the piece of wood may swing freely upon the nail. The nail is to be held by two blocks

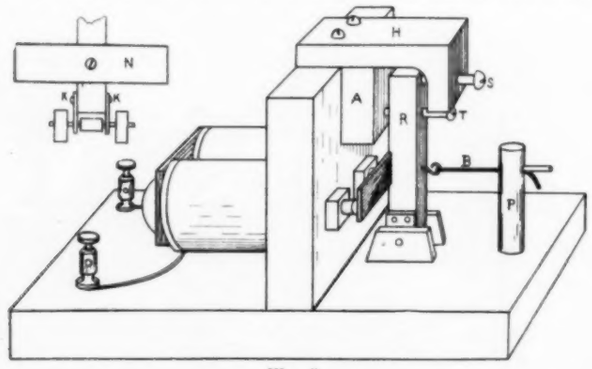


Fig. 3.

screwed to the base board as shown at the left of the figure, and the piece is prevented from moving sidewise upon the nail by a small bit of wood in the center of the nail.

A piece of iron, shown at N is next to be screwed to the piece of wood just described. This piece of iron should be 1-16 inch thick if possible, or at least should be made of a sufficient number of thin pieces to make up a total thickness of 1-16 inch. Its length is 2 inches, its width ½ inch, and it is mounted at such a height above the base board that its center is level with the centers of the projecting bolts. It should be at such a distance from the latter that there is about ⅛ inch between the iron strip and the bolt when the wooden piece stands vertical.

At the center of the upright board which sustains the coils, fasten a block of hard wood, shown at A. This block is 1 inch long, ¾ inch wide, and ⅜ inch thick. It should be fastened by means of screws and glue in the position shown.

The piece of wood shown at H is 2 inches long, ¾ inch wide, and ¼ inch thick at its thin end. At the other end it curves around at right angles on its inner side, the arm projecting downward being ⅞ inch long measured outside. When screwed to the upright board as shown, there should be a clear space of ¾ inch between the block A and the inside vertical edge of H. The arm R, when vertical, should be in the center of this space.

Through the armature lever R, bore a hole whose center is ⅛ inch below the end of H. This hole should be large enough so that a brass screw ¾ inch long shall fit tightly in the hole; and be capable of adjustment by turning it one way or the other. Similarly, a brass screw of the same size, shown at S, is screwed through the wooden piece H. If difficulty is experienced in boring these holes without splitting the pieces, bore a very small hole first, and burn it out to the right size with a red hot wire.

These screws are for the following purpose: When there is no current through the magnets, the lever R is held against the screw S by the tension of the rubber band B. When a current goes through the coils, the iron cores acting upon the armature N draw it and the attached lever R toward the magnet, causing the screw T to strike against the block A. Of course, then the screws S and T must be adjusted so that the armature may move back and forth as just described. It moves through about ⅛ inch at its upper end. It is absolutely necessary that the screws be filed flat on the end so as to make a loud sound when they strike the wood.

The rubber band mentioned is fastened to the armature by a hook made from a pin driven through R. The other end passes through a hole in the post P, and is held by a peg driven into the hole in the post.

HOW TO PLATE CARBON BRUSHES WITH COPPER.

QUESTION:—Please state how to plate carbon brushes of a motor with copper so they can be soldered to the holders. Can carbon and copper be soldered together?

ANSWER:—To plate the surface of a piece of carbon such as is commonly used for brushes on electric motors proceed as follows:

Clean carefully that part of the brush which is to be plated, with a piece of fine sandpaper, taking care not to touch the part to be plated with the fingers. Immerse the brush in a solution of copper sulphate (blue vitriol), made by dissolving ½ pound of the sulphate in one quart of water. Take a piece of sheet copper and bend it into such a shape that it will surround the piece of carbon on all four sides, and place it in the solution so that it surrounds the carbon without touching it at any point. There should be at least ½ inch of clear space between the carbon and the copper.

Connect the carbon to the zinc pole of a powerful battery and connect the copper with the other pole of the battery. Allow the current to flow for about one hour. By this time the surface of the carbon will have become coated with a bright coating of copper. The length of time required will depend upon the strength of current used, and can best be determined by experiment. A weak current gives a finer deposit, but takes longer. A teaspoonful of sulphuric acid added to the solution will improve the quality of the deposit. There is no way of soldering directly upon carbon, but connections can be soldered to the copper plate deposited in the manner just described.

TROUBLE WITH MOTOR.

QUESTION:—I am taking care of a 15 h. p. motor which is used to run a planer, a circular saw, a band saw, a joiner, and ten small lathes. Every few days the commutator is covered with a black substance which I suppose is carbon. At this time the commutator is very hot, and sparks at the brushes. Is this due to soft carbons?

ANSWER:—The symptoms seem to indicate that the motor is overloaded. A planer usually requires 5 h. p., circular saws and band saws from 3 h. p. to 5 h. p. each, a joiner 3 h. p., and small speed lathes about ½ h. p. each. This would make a total of at least 20 h. p. required in the above case, if all machines are running.

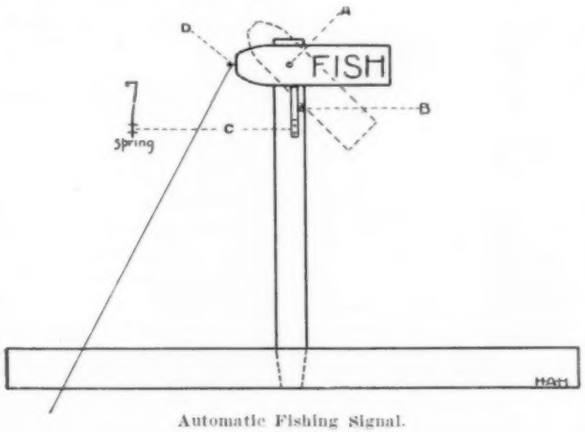
If the only point at which the motor heats is at the commutator, it is possible that some relief may be obtained by using thicker and wider brushes, if the brush holder will take them. Of course the brushes should be set at the right point in any case. If larger brushes cannot be used, the only remedy is to reduce the load.

The Cobden club of London has appealed to the free traders to contest the proposal to tax grain and flour, claiming that it would undo the great work of Peel and Gladstone.

A FISHING SEMAPHORE

An interesting mechanical device is the fishing semaphore, that instantly shows when a fish is on the hook, and which any boy can easily make. The line may be baited and set and the fisherman can give his attention to other things with only an occasional glance at the signal.

To make the semaphore take a piece of plank about 12 inches square and two inches thick. If a single piece cannot be had build a block of this size out of smaller stuff. Bore a hole in the centre one inch in diameter and in this drive a piece of wood



Automatic Fishing Signal.

two inches square, 12 or 15 inches long and pointed at the lower end. Take a thin piece of wood 2 inches wide and 6 inches long for the semaphore and shape as shown in the cut. Bore a small hole 2½ inches from the narrow end and fasten to the upright part by driving a small round nail at A. Drive another nail at B within one-half inch of the head as a rest for the semaphore. At C fasten a strip of thin sheet iron outside the semaphore. The strip should be bent flat at the top and not press too snugly against the signal. At D drive a small nail and attach the line. When the fish takes the hook it will throw the signal up to a horizontal position and the spring C will hold it there. The semaphore may be painted red or bear the word "Fish."

NEW METHOD OF CAR WIRING

A new departure in wiring street cars for lights is illustrated in the Street Railway Journal, which says: As will be seen, the lamps are arranged in groups of four in multiple, instead of having five lamps in series, there being twenty lights in the car. The arrangement has the advantage that in case a lamp burns out only one light goes out instead of five. The burned-out lamp is, of course, replaced as soon as convenient, but no great harm is done if the lamp is not immediately changed. The arrangement is particularly advantageous when the headlight is on the circuit, as it is not put out by the extinguishment of one of the lamps within the car.

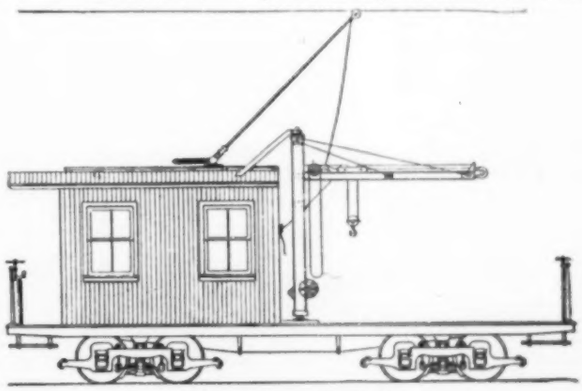
THOUGHT HE HAD RABIES AND DIED.

B. & O. Engineer So Frightened from a Dog Bite that He Had All the Symptoms of Hydrophobia.

Albert Jones, of Newark, O., engineer on the Burlington & Ohio, died at the Garfield Park sanitarium in Chicago with all the symptoms of rabies, occasioned solely through fear of the disease. Jones was bitten by a dog last Thanksgiving and shortly afterward it occurred to him that the animal might have been mad. Although it was well known by others that nothing was the matter with the dog, it was impossible to convince Jones of this fact, and the more he thought about it the worse became his fright. The worrying became so intense that he actually manifested symptoms of hydrophobia and friends advised him to go to Chicago for treatment at the Pasteur institute, thinking it might at least allay his fears. On the train en route to Chicago he was seized with a spasm while drinking water and terrorized the passengers by barking, howling and snarling like a ferocious dog. The man was hurried to the sanitarium where he died in great agony, showing all the signs of hydrophobia. Physicians at the institute in Newark, O., all maintain that Jones worried over his chance of developing hydrophobia until his nervous condition actually assumed the symptoms which he had dreaded for five months.

ELECTRIC CONSTRUCTION CAR.

Electric railways are fast adopting the labor saving devices used on steam railroads. They now have powerful cranes which



CONSTRUCTION CAR.

will lift 20 tons, mounted on flat cars and which can be run to any point on the line. Electric motors furnish the power.

Stoddard, inventor of the steam calliope, died recently. He also invented a fire escape. The fire escape was invented last.

A company has been organized in Madrid, Spain, with a capital of one million dollars, to develop 3,000 horse power at a waterfall in the Jarama River. Current will be furnished for light, power, and railway purposes.

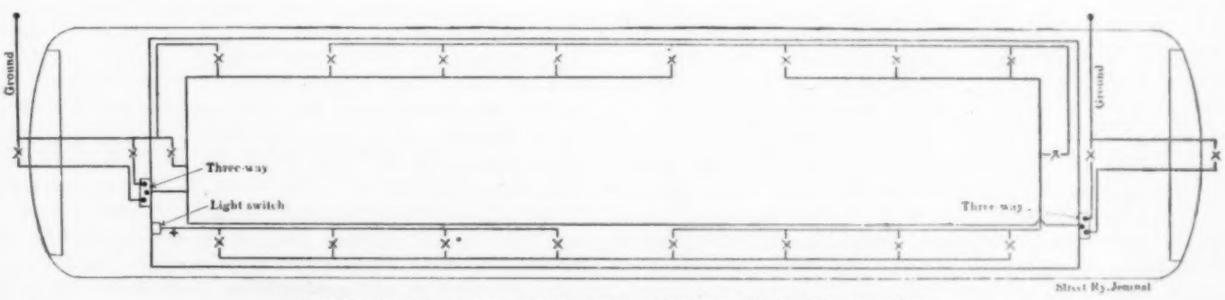


DIAGRAM FOR WIRING CARS WITH LAMPS IN MULTIPLES OF FOUR

Popular Mechanics

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Popular Mechanics is an illustrated weekly review of the mechanical and engineering press of the world, presented in plain, simple language, and condensed as much as possible. We always credit publications from which illustrations and facts are taken. Where the name only of such publication is given, it indicates we have used practically the entire article. Where name of publication with date of issue is printed, we have made only a brief digest, and those of our readers who desire to study all the details of the subject should procure from its publishers, or their local newsdealer, the copy of that date

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POPULAR MECHANICS

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FIREMEN ARRIVE DAYS AFTER FIRE STARTS.

Any Time Within a Week to Answer Fire Alarm Will Do in France.

Nothing so interests the Frenchman who comes to America as the celerity with which the fire companies answer fire alarms. In Paris the buildings are of slow burning material, says the Western Fireman, the beams being laid in plaster. The American consul at Copenhagen was in Paris when a fire broke out in the ceiling of his room. He relates the following:

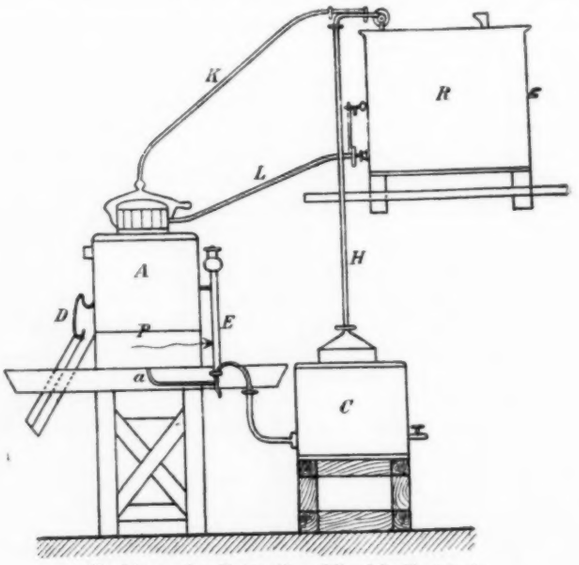
"I notified the proprietor, who instead of turning in an alarm, slowly ascended three flights of stairs, leisurely inspected the 'conflagration,' and said: 'We must call the police.' I said, 'Why not call the fire department?' He said, 'We shall be fined if we call the firemen before we call the police.' In the course of half an hour a policeman came in and looked at the fire.

"In the meantime the landlady insisted on our sitting down to dinner in the room adjoining the fire. This we did while the fire brigade was taking dinner or something else before answering the call. The fire inspector said the fire had been burning eight days. A defective fireplace had ignited a beam, which being imbedded in plaster, could only char, and if the fire brigade arrived in a day or two it would be on time."

EXTRACTION OF OIL BY CHEMICAL PROCESS.

The American consul at Marseilles, Robert P. Skinner, reports a process there of extracting oil with chemicals, a method which many persons in this country have long been anxious to discover. Olive and various vegetable oils are made for soaps and other than food products. There are two methods, one using gasoline, a somewhat dangerous process, on account of liability to explosion; the other employing sulphide of carbon, which is safer, though not without danger. After pressing out 85 per cent of the oil, the oil cake is broken into pieces the size of a hazelnut and 30 tons put in a tank with an equal quantity of sulphide of carbon. One machine will handle 110 tons of oil cake a day with a loss of sulphide of only 1100 pounds. The sulphide is used more than once. The plant visited cost $16,000 and had 165 tons of sulphide in use all the time. After extracting the sulphide the remaining pulp is sold for fertilizer. Consul Skinner says:

"I give a rudimentary sketch of the mechanical arrangements necessary for the use of sulphide of carbon or petroleum essence. The raw material is emptied into the tank of basin *A*, and falls upon the false bottom *P*. An equal quantity of the solvent enters the tank through the tube *L* from the reservoir *R*. From



Machinery for Extracting Oil with Chemicals.

E steam is conducted through coils under the false bottom *P*, and brings the mixture to a boiling point. The oil remaining in the cake is immediately released and rises to the surface with the boiling sulphide of carbon. The vapor arising from this hot mass is carried off through the tube *K*, to be eventually cooled down and returned to the reservoir *R*. When the boiling process has continued a sufficiently long time, the liquid is drawn through the tube *a* and kept hot by passing through steam coils and finally lodged in the second tank *C*, in which the temperature is brought to such a point that the dissolvent is converted into vapor, passing upward through the pipe *H*, to be condensed and discharged into the reservoir *R*, leaving the oil and a small portion of the dissolvent which fails to pass off as vapor in the bottom of the receptacle. At this point, live steam is introduced, which frees the oil completely from the small remaining quantity of sulphide of carbon, after which the oil itself is easily drawn off into a receiving tank. Live steam also frees the pulp in the tank *A* of the small amount of sulphide of carbon remaining, after which it is discharged at *D*."

Thus it will be seen that the process is not a continuing one, but by the use of a series of tanks and the proper connections, Verminck & Co. succeed in making the system practically continuous.

MEASURE FLOW OF UNDERGROUND WATER.

The velocity of the flow of underground water has been measured by a unique device of the United States Geological Survey, under Prof. C. S. Slitcher of the University of Wisconsin. The measurements were of the underflow in the sand of the Arkansas river. Two set wells were driven and electrically connected. Into the up stream well was placed an electrolyte or dissolved substance which effects the electric current. The electrolyte entered the underground water at the first well and gradually passed down stream to the second. In the electrical circuit between the two wells the needle of an instrument recorded its approach, and was strongly affected by its final arrival. By watching the increasing deflection of the needle it was possible to trace the movement of the water from the beginning of the experiment and to study the variations of its flow.

HIGHEST SALARIED MAIL CARRIER IN THE WORLD

One mail carrier in the United States makes but two trips a month and gets $35,000 a year in payment therefore. His name is Oscar Fish and he is said to be the best paid mail carrier in the world. But post-office department officials contend that as his route is the most dangerous in the world and he makes his trips by dog sled, the sum paid to him is quite reasonable. Fish's territory is in the wilds of Alaska. He carries the mails from Valdez to Eagle, a distance of 413 miles. He has the finest team of dogs in the Northern country and some of his trips are made in excellent time. He has been given up for dead many times by residents of Valdez and Eagle, but so far has always managed to reach the end of his journey, although sometimes overdue and occasionally battered up. He has fallen over precipices, been mixed up in avalanches, has been starved, frost bitten and injured, but is still drawing his $35,000 a year from the government and says he expects to continue making his adventurous trips until snowed under.

WONDERFUL RESULTS FROM OYSTER PLANTING.

So great a source of revenue has oyster planting proved to be that the industry has instilled new life into Lancaster County, Va., which is now enjoying prosperity far greater than the fondest hopes of its inhabitants ever dreamed of. Dr. W. T. Thom, in a bulletin of the United States Department of Labor says:

"Until within the last twelve months there has never been a bank in Lancaster county, nor until very recent years, in a section of Tidewater Virginia, almost three-fourths as large as Massachusetts. Now there are two banks in Lancaster county, one a state and one a national, and this local supply of capital is a result of the oyster law."

The oyster beds leased and protected by the state could have been bought a few years ago at a little more than a dollar per acre. Last fall they were worth $50 an acre; this spring they are held at $100 an acre, and the price is advancing rapidly.

Oyster beds, which were made barren, have been leased at $1 per acre. They have successfully grown oysters upon them, either by planting oyster "seed" or by covering the beds with oyster shells and then waiting for the "spawn" to strike on the shells.

OLD AGE PENSION SYSTEM IN DENMARK

Every native or naturalized person of the age of 60 years in Denmark, who is found unable to support himself or his family, is entitled to a pension on the following conditions:

That the applicant has not been found guilty of an action considered dishonorable in public opinion.

That his necessity is not due to actions by which he, for the benefit of his children or others, has deprived himself of means of support; that his necessity is not due to an irregular or lavish life, or has not been caused by himself in any other way.

That he, during the ten years preceding his application, has been a permanent resident of this country, without having received, during this period, any public relief and without having been adjudged a vagrant or a beggar.

The British army is to be equipped with a new rifle. It is 19 ounces lighter and the barrel five inches shorter than the rifle now in use, but it has the same range. It has the Mauser breech mechanism and an improved bolt action. It is provided with a wind gauge and a foresight and will hold ten rounds of ammunition in the magazine.

GROWING FRUIT FOR UNCLE SAM

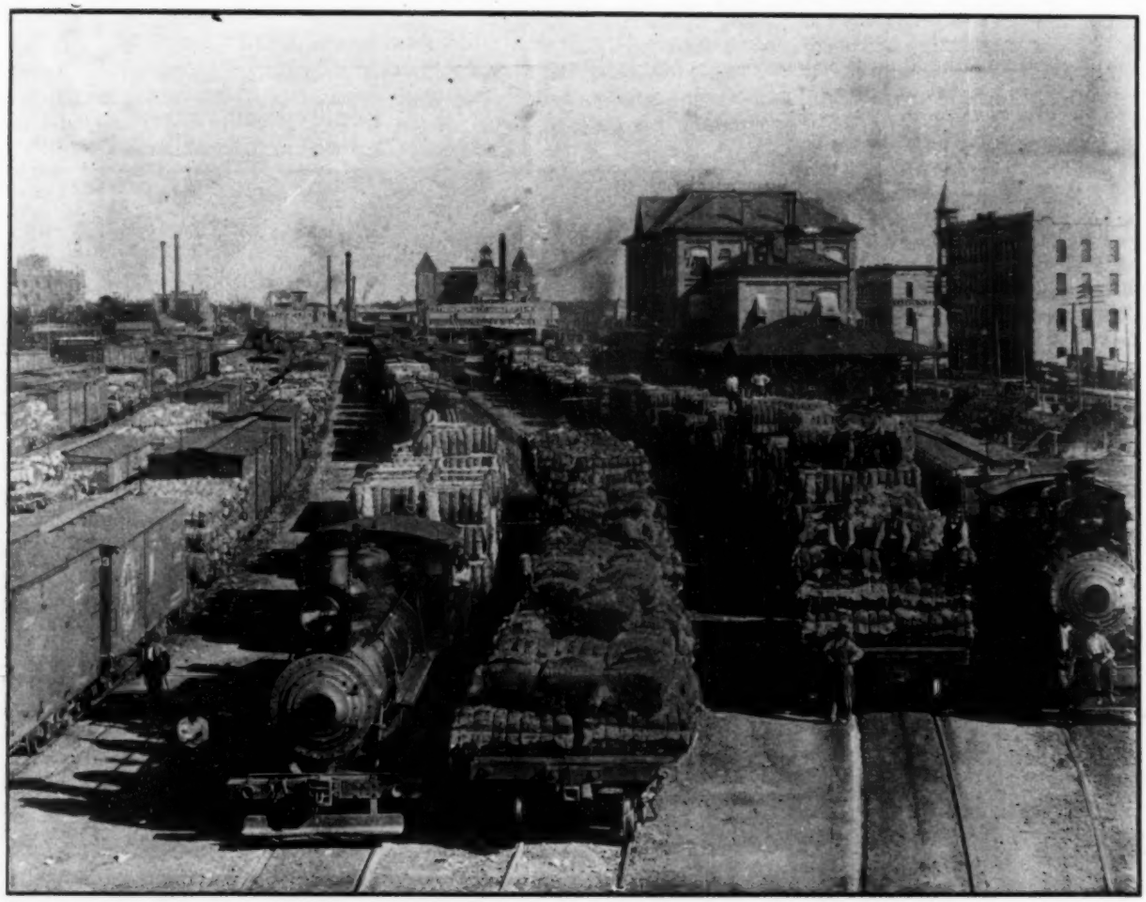
Supplying the United States with fruits from the tropics has grown into an enormous enterprise to which many lands and millions of dollars in capital contribute.

Loading Bananas at the Farms.

Every important port in the tropics is busy every day in the year shipping fruit to the United States. Fast going steamers are employed in the shipments and the fruit is landed at the nearest United States harbor. New Orleans, Key West and Tampa, Florida, probably receive the greatest shipments of any American ports. The Railway Conductor illustrates scenes of banana culture and shipments in Costa Rica, which is one of the greatest of banana growing countries. At nearly every railway siding in the country such scenes as are herewith illustrated are of common occurrence.

A Banana Farm.

It is said that some of the large American railroads are vitally interested in the shipping combine and ultimately will appear as the principal owners.



Cotton Shipping Scene in Houston, Texas.

THE WORLD'S GREATEST COTTON SHIPPING CENTER.

Houston, Tex., "where the sweet Magnolias bloom," is the greatest cotton shipping point in the world. Here cotton trains from all over Texas and other states meet en route to Galveston, New Orleans and other seaports, where it is loaded on ships for Europe. The accompanying cut shows a cotton shipping scene at one of the railway depots of Houston, where fourteen railroads are centered. Such scenes are familiar sights in the city which handles about 2,500,000 bales of cotton every season.

FOR AN AERONAUT'S RACE TRACK IN THE AIR.

An aerial speedway fiften miles in circumference marked by captive baloons may be established at the St. Louis World's Fair at the sugestion of Santos Dumont, the world famed aeronaut. He said:

"My idea is that the track should be around the city of St. Louis and visible for the whole distance from the exposition grounds, which are to form the startting and finishing points. There should be a series of races varying in distance from one to several times around the track. But I am strongly in favor of establishing one big race, a sort of aerial grand prix, with a $100,000 prize. This would be a great stimulus to competition and should attract a number of inventors of the various systems of dirigible balloons. I shall certainly participate in the contests and I hope to meet with many rivals."

MEAN BOARDING HOUSE TRICK.

Patrons of a New York boarding house played a mean trick on the mistress. They placed a phonograph in the kitchen and bribed the cook to set it working when the mistress was cooking. Soon after the boarders assembled and invited the landlady to join them in listening to a "new kind of talking machine." This is what she and the others heard:

"Mary, you needn't pay over eight cents a pound for meat, anyhow. It's good enough for them. You can get it in Mulberry street for that. You are giving too big prices for steaks. If they don't like it, let 'em eat more vegetables. Yesterday you bought fresh pie. How often have I told you to save five cents by getting it stale and warming it up? Then this bill of twenty-five cents a pound for coffee is too much; coffee at fifteen cents a pound will do in future. I've got enough trouble to make both ends meet without paying such high prices!"—Continental Chit-Chat.

ADULTERATION'S LIMIT.

We've stood for almost every kind of food adulteration,
And never uttered but the mildest sort of condemnation;
The coffee might be filled with beans by methods underhanded;
The pepper might be bits of bark, and all the sugar sanded;
But now's the time to speak out loud, and not to feebly mutter—
They're putting artificial hairs in artificial butter!

—What To Eat.

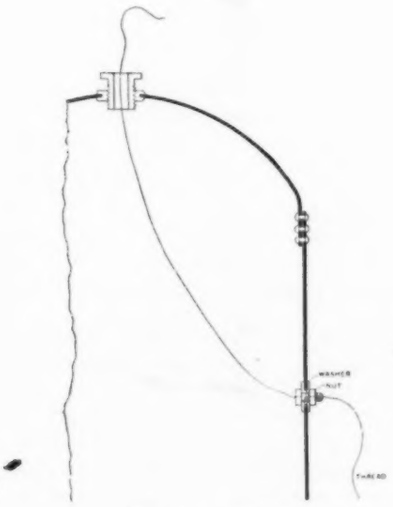
Andrew Mills, retiring president of the Savings Bank Association of New York State, said: "Today the depositors of the banks of this state could pay the entire national debt of $1,931,000,000 and still have $200,000,000 remaining."

A post mortem examination on an ostrich which died at the Lincoln Park Zoo, Chicago, showed safety pins, pocket knives and pieces of glass to have been a part of its diet.

SHOP NOTES

REPAIRING A RANGE BOILER

An ingenious method of stopping a leak in a range boiler, which was too large to solder, is described in the Metal Worker. The plumber made a perfectly round hole at the point of leakage, and large enough to take a ¼-inch bolt with a soft washer in



Drawing in the Bolt.

the inside. The bolt and washer were secured together and dropped into the boiler through the hot water opening at the top, a piece of thread being tied to each end of the bolt. The lower end of thread was then fished out through the hole, with a wire; the bolt drawn through and another soft copper washer put in the outside. Cement was freely used and the washers set up tight by tightening the nut. The same scheme can be worked in mending pipes and tanks where the material is too thin to tap and plug.

TO DETECT WORKING OF CHECK VALVES.

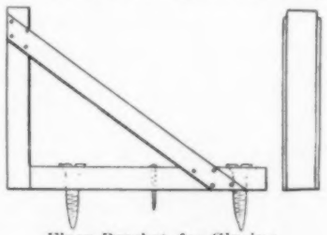
If your check leaks or "backs up," it is liable to bind from expansion, says Wm. Kavanagh in Power. When our check becomes inoperative from any of the above causes, it may become necessary to take off the bonnet in order to make repairs or clean the valve out. If we take a piece of stout wire about 12 or 14 inches long, placing one end of the wire on top of the check and the other end in the ear, we can hear every stroke of the pump or check and soon become accustomed to the regular or irregular action of the same. In like manner, we can form a pretty fair idea of the action of our pump valves by placing one end of the wire on the cover of the water end of our pump and listening. While listening, it is a good idea to cover the ears with the hands, allowing the wire to pass through the fingers of the hand; this excludes other noises and enables us to hear the action of the valves more distinctly.

STEAM BOILER INCASED IN OIL.

A German engineering journal describes a double boiler, one within the other. The inner one holds the water, while the outer one is filled with oil. The heat applied to the latter heats the oil and indirectly the water in the inner boiler. The article describing this apparatus states that the advantage consists in the much higher boiling point of oil, which permits of a higher temperature and thicker boiler plates without danger of injury to the metal.

FLOOR BRACKET.

Chas. Cloukey in the Wood Worker tells how to make a floor bracket for gluing up circles or other bent work of somewhat limited width. The vertical and horizontal pieces are ⅞-inch oak, ¼-inch wider than the jaws of the handscrews to be used, and should make the bracket about 7 by 10 inches for ordinary work. It is well not to have the floor pieces too long, as they object to being put into a very small circle. The braces are made of ½ x 2-inch oak and nailed on with 6-d common nails. Some users prefer to glue on a solid triangular piece instead of nailing on the strip. One nail to facilitate putting bracket in place,



Floor Bracket for Glueing.

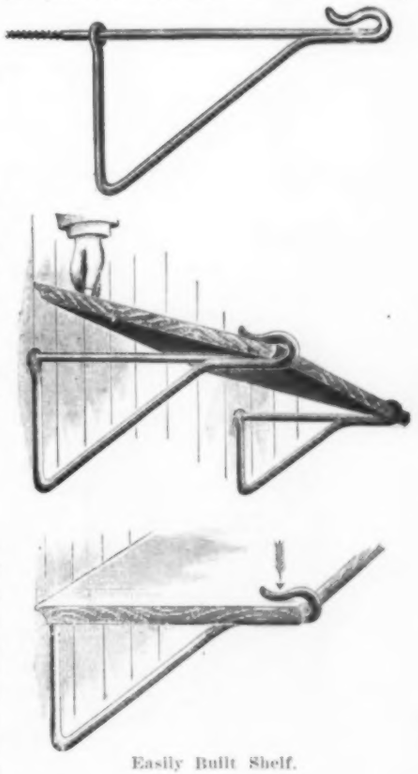
and two screws to hold it there, provide a simple method of fastening. Once when we were crowded for floor space, a workman attached the brackets to pieces of plank, and after the hand-screws were in place, stood the whole business up against the wall to dry.

BORAX FOR WELDING.

There are a good many excellent welding compounds for steel welding, says the American Blacksmith, but pure pulverized borax is probably the best. The main thing in welding steel is to keep the parts clean from dirt. If they are joined as when welding a spring or tire, or putting a piece of steel on a grub hoe, to get the parts to stay perfectly at their place when taking the heat is half the battle.

DETACHABLE SHELF

A simple but serviceable detachable shelf has just been brought out. The cut fully



Easily Built Shelf.

explains the scheme. Anyone can put it up in a minute.

ENORMOUS PRESSES FOR MAKING ARMOR PLATE.

Presses weighing 800 tons and of 8,000 horse power, are the kind used in the manufacture of armor plate for vessels of war. These enormous presses consist of two hydraulic cylinders 3.28 feet in diameter, with a 10-foot stroke. They are supported by cast steel cross-pieces held by four forged steel columns. The press is actuated by steam pumps.

The levers that control the press, says the Marine Journal, those of the traveling cranes that support the ingot and those for driving the different tools are placed side by side. The work can thus be performed with truly extraordinary facility. The arrangements are such as to permit the ingot to be turned over so that the two faces can be flattened in succession. The ingot which weighs from 70 to 80 tons is carried by a 150-ton traveling crane. An ingot 4.25 feet in diameter is converted into a plate 14 inches in thickness and its length increased from 6 to 21 feet in less than an hour.

Peggy Fryar, a famous danseuse in the early reign of Charles II, has again made her appearance before the footlights and danced before a London audience a few nights ago. She is 71 years old.

STOP CLOCK FOR ENGINE HOUSE

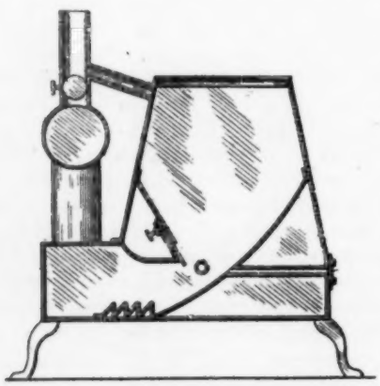
In nearly all cities the firemen are required to keep a record of the time the crew and apparatus are absent from their station in response to an alarm of fire. Naturally when the gong strikes every effort is made to get out of the house as quick as possible. To keep an exact record of the time without the attention of any person a stop clock has been devised by A.

Ready for the "Stop."

M. Johnson of New Haven, Conn. This consists of two dials marking the same time of day, but the lower one is connected with a rod, through which a pin is inserted. A wire connects this pin with the fire engine and when the steamer goes out the pin is removed, the rod falls and the lower clock stops. On return to the station a comparison of the two dials shows the exact length of time they have been out.

STOVE TO BURN SAWDUST.

Stoves to burn peat, hay, corn and various other unusual kinds of fuel have been



Sawdust Stove.

devised, and now there is one to burn sawdust. When this stove once gets busy the price of stuffed dolls will certainly advance.

VICTIMS OF LIGHTNING'S MIGHT.

Seven Hundred Persons Slain in the United States Every Year by Thunderbolts.

An average of more than 700 persons are killed by lightning every year, according to United States Weather bureau statistics. A careful compilation made in 1900 shows:

Deaths, 713; of which 291 were killed in the open, 158 in houses, 57 under trees and 56 in barns.

Injured: 973; of which 327 were in houses, 243 in the open, 57 in barns and 29 under trees. Alfred J. Senry, of the United States Weather Bureau in the Western Electrician says:

"The number may vary as much as 10 per cent, but it may be accepted as a fact that from 700 to 800 lives are lost each year from lightning stroke.

"The greatest number of fatal cases occurred in the middle Atlantic states, and the next greatest in the Ohio Valley and Tennessee with the middle and upper Mississippi Valley a close third. The greatest number of deaths in any one state from 1896 to 1900 was 186 in Pennsylvania; next 135 in Ohio. Illinois, Indiana and New York had 124 victims each. The greatest fatality from a single stroke occurred at Chicago, where 11 persons huddled together in a zinc-lined shanty under a north shore pier met death by a single stroke.

Prof. Henry, in explaining the phenomenon of lightning, compares the air between the clouds and the earth to a great thickness of glass. Up to a certain point, he says, the air is able to resist the stress in it due to electrification of the cloud mass. Whenever the stress passes a certain limit, which may be called the breaking point, the air gives way; literally it is cracked from cloud to earth, like a piece of glass, as the bolt descends. While human foresight is able to say approximately when a flash will occur, it cannot say where the air will give way first. The following precautions against lightning stroke are given:

"It is not judicious to stand under or near trees during thunderstorms, in the doorways of barns, close to cattle, near chimneys and fireplaces, or near the terminus of a wire clothes line. Avoid suspending the latter between a corner of the house and a convenient tree, rather let is be hung from one tree or post to another. There is not much sense in going to bed or trying to insulate one's self in feather beds. Small particles of steel, also, do not have the power to attract lightning, as it is popularly put, or determine the path of discharge.

Finally, if one should be in the vicinity of a person who has just been struck by lightning, no matter if the person struck appears to be dead, go to work at once and try to restore consciousness. Lightning often brings about suspended animation rather than somatic death. Try to stimulate the respiration and circulation. Do not cease in the effort to restore animation in less than one hour's time. No matter which method of respiration is used, it is important to maintain the warmth of the body by the application of flannels, bottles of hot water, hot bricks, warm clothing, taken from bystanders, etc. Firmly and energetically rub the limbs upward, so as to force the blood to the heart and brain. If an assistant is present let him attend to this. Above all things, nothing must interrupt your efforts to restore breathing. When swallowing is established, a teaspoonful of warm water, wine, diluted whisky or brandy, or warm coffee, should be given. Sleep should be encouraged. In brief:

1. Make the subject breathe artificially, imitating the respiratory movements of the chest.
2. Keep body warm.
3. Send for a physician.

NAME FRIDAY AS SAILING DAY.

A movement to smash the old superstition regarding the departure of a ship on a voyage on Friday has been inaugurated by the White Star line, which has begun a service of Friday sailing from the New York port. It is the first line to have Friday as a sailing day. The new movement is also significant as it may be regarded as the opening wedge of a daily trans-Atlantic service.

ELECTRIC RAILWAY TO USE 32,000-VOLT TRANSMISSION

Electric current with a voltage of 32,000 will be transmitted 60 miles from the power house over the wires of the Union Traction Co. of Indiana. This will be the heaviest work of this kind ever attempted by a street railway. The three-phase system will be employed. At intervals the current is transformed to lower voltages for working purposes. The enormous strength of this current is understood by comparison with the ordinary arc light which, with its 2,000 volts will kill instantly. The railway has its own right of way and every precaution is taken to insulate and protect the wires.

A foreign postage rate of 5 cents per half ounce and fraction thereof is charged for letters to Great Britain and Ireland, France, Spain, Germany, Austria, Denmark, Switzerland, Italy, Russia, Norway, Sweden, Turkey and Egypt. Newspapers are 1 cent for 2 ounces.

Dong Shui is said to be the only Chinese tramp in the world. He travels about from city to city, but refuses to have anything to do with other Chinamen.

Please show Popular Mechanics to your friends. It will interest them.

FOR THE MADAM

SPRING ROCKING CHAIR

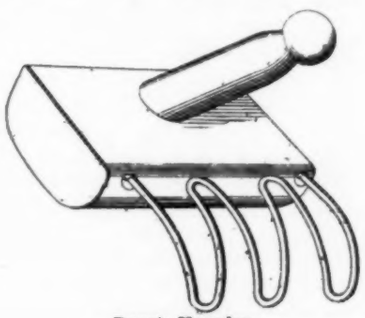
The latest idea in a rocker is one with springs on the principle of the old fashioned stage coach. Two Kansas City men

Spring Rocker.

thought out the idea. It will bother the small boy to stand on the rockers of this chair.

DOUGH KNEADING DEVICE.

By using the invention of a Michigan man the cook need no longer knead dough



Dough Kneader.

with her hands. The bent wires are to perform the mixing operation generally performed with the fingers of the person making the dough.

TO PROTECT GIRLS FROM DANGEROUS MACHINES

A law prohibiting the employment of women and girls at machines where they are likely to be maimed is being urged by the Chicago Federation of Labor, and the Illinois State Federation of Women's Clubs. R. A. Hart, who is a leading factor in the movement, says that many hundreds of women are endangered daily in the tin can factories and other such establishments of Chicago. He said:

"When these girls are injured and can work no longer at the machines, they find themselves handicapped for life. They cannot secure employment in the stores because merchants do not want clerks with crippled hands. If they marry, their husbands must be willing to accept wives who cannot attend to household duties. We want a law that will protect the women from accepting employment that makes them operate dangerous machines."

SAYS KISSING IS NO HARM

Dr. Christopher Nyrop, author of "History of Kissing," and recognized as the one great authority on kissing in the world, declares that there is no harm in osculation. He quotes Italian authors who say: "A mouth is not the worse for being kissed," and a French poet who asks: "Bah! What are two kisses? Only two bullets that have missed the mark." A Norwegian song says: "Johannesen kissed the girl, once, twice on the mouth and each time she was glad of it." He quotes from other nationalities, all of which hold the same view. The professor, however, admits that stolen kisses may bring a man into peril. He tells of Thomas Saverland of London, who in 1837 complained that Miss Caroline Newton had bitten a piece out of his nose while he was trying to kiss her. Miss Newton admitted that she had done so, but claimed that she did not want to be kissed, whereupon the judge dismissed the case, saying, "When a man kisses a girl against her will, she may bite off his nose if she likes."

WOMAN SELLS HER STREET CAR LINE.

The Delaware Street Railroad of Delaware, O., the only line in the country managed by a woman, has been sold to the Columbus, Delaware & Marion road for $55,000. It was owned by Mrs. George Brown-Allen, who made more than $10,000 profit by the deal. She took charge of the road just after it had passed from the hands of receivers. The property was valued at but $13,500 last summer. Mrs. Brown-Allen is a short, dark woman, alert in figure, wearing a slouch hat over short curly locks. She introduced the plan of half fares on Sunday which surprised old street car men in its great success and made many other innovations that increased the popularity of her line and made it a paying business.

The Western University of Pennsylvania is to be moved to Pittsburg and will be endowed and developed on an immense scale by Andrew Carnegie.

The next leap year will be 1904. Every year the number of which is divisible by four without a remainder, is a leap year, except the last of the century, which is a leap year only when divisible by 400.

LEAD FILE HANDLE

A correspondent of the Wood Worker gives directions for making a file handle which is worth trying.

Turn up a file handle, cutting away a re-

File Handle.

cess on end for ferrule, skip back about ¼ inch, cut another groove, and then after connecting these with a couple of "bias" channels about the same width as grooves, wrap a piece of paper around shank and pour in babbitt metal.

HOW TO CARE FOR ALUMINUM COOKING VESSELS.

Aluminum cooking vessels are rapidly growing in favor, but some housewives are having much trouble with them because of ignorance of the proper treatement they should be given. An official in charge of the instruction department of the Aluminum Cooking Utensil company of Pittsburg, Pa., says:

"Aluminum must be cleaned to be kept in order. If an aluminum utensil is set away where it is not kept clean and dry it may in time darken and this darkening is largely due to the accumulation of dirt, etc., and to some extent also to chemical action upon the metal itself—a true tarnish. If, however, the same utensil is occasionally washed and rubbed there should never be any perceptible discoloration. Wash each utensil well in hot water and plenty of soap, dry with a cloth and place empty upon the hot stove for a few minutes. The object should be dried quickly and thoroughly.

"Never boil ashes, lye or other alkalies, such as soda, potash, ammonia, etc., in an aluminum utensil. The inside may be scoured with bath brick dust. Use any good silver polish for the outside."

LOBSTER PIRATE MAKING A FORTUNE.

A lobster pirate is making a fortune in the waters of Maine buying short lobsters from the fishermen and boiling them on a steam launch which he has fitted especially for the purpose. The lobsters are bought for two cents each. He breaks the tails and claws from them and has nothing to fear from the fish and game wardens for there is no evidence to convict him. His launch is provided with a large boiler and he can handle 800 pounds of fish a day. He sells the lobster meat in Boston where he obtains good prices from the hotels and restaurants. He contemplates buying three more launches this summer.

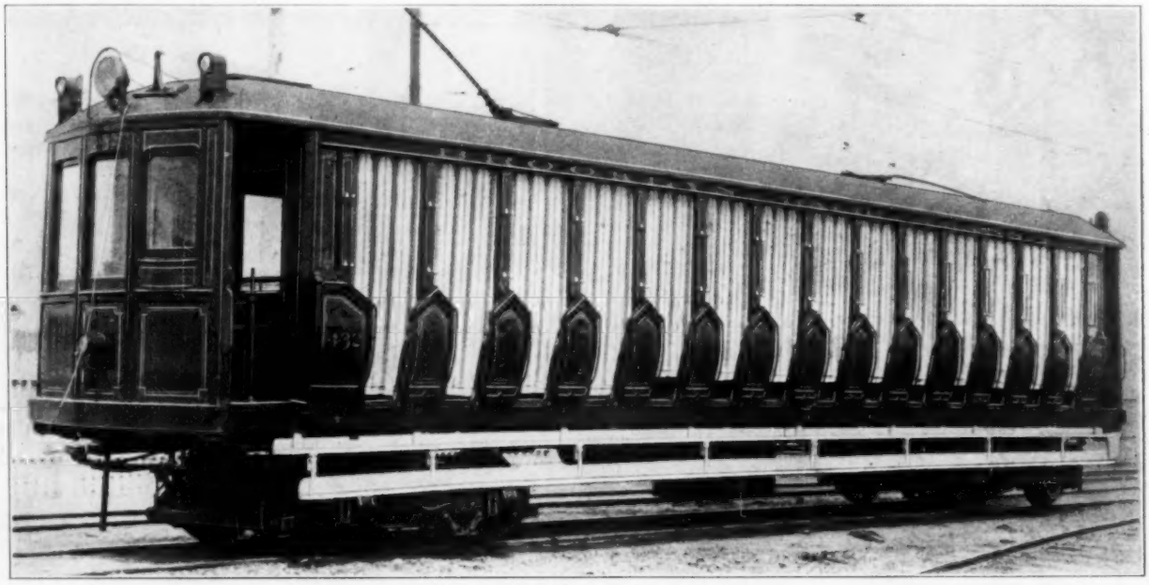
Stephen Payne, the veteran colored fireman who died in Chicago a few days ago, was the inventor of the sliding pole, which is in use in every fire station in America.

OLDEST BRICK PLANT IN THE WORLD.

The oldest brick plant in the world is believed to be that at Nivaagaard, Denmark, which celebrates its second century anniversary this year. The plant, says Brick, began operations in 1701 for the purpose of manufacturing brick and terra cotta to be used in building a castle for Queen Louise. The records show an output of only 350,000,000 brick in 200 years, about half of which was produced in the last 25 years.

OPEN CAR FOR ELEVATED ROAD

An open car for use on the Coney Island line of the Brooklyn Heights railroad has been built at the company's shop. The car will run part way on an elevated structure and descend on a grade to the surface line. On the elevated portion the station platforms are on a level with the car floor. On the surface, steps attached to the car are let down. By the movement of a lever on the car platform gates open and close at the end of each seat to prevent passengers falling out. The car is 43 feet long and seats 90 persons. In case of rain curtains are let down as shown in the cut which is taken from the detailed description of the car in the Street Railway Journal of April 26.



New Type of Open Car for Brooklyn Elevated Line.

HOW PAPER CURRENCY IS MADE.

Manufacturing the fiber paper for United States currency is a carefully guarded secret. The paper is made by a Massachusetts firm under government supervision. It is the introduction of the silk threads into the paper that counterfeiters for many years have tried in vain to understand. It is these threads that make imitation of the paper well-nigh impossible.

The paper is made of the finest rags, cleansed, boiled and mashed into pulp. As it is rolled into thin sheets the silk threads are introduced by the secret process.

The sheets of paper already counted twice and placed in uniform packages at the paper mill, says the Ladies' Home Journal, are stored in a treasury vault and issued to the bureau of engraving and printing as wanted. Before leaving the treasury they are counted three times more and the receiving official at the bureau must receipt for them. Then the bundles are unwrapped and the sheets are counted 28 times by a corps of women. This is to insure that each printer gets the recorded number—no more, no less. If any sheet be lost the employes responsible must make good the amount.

ELECTRIC CANNON MAY REVOLUTION IZE WARFARE.

An electric cannon, which many believe will revolutionize warfare, is exhibited in Berlin, Germany, by Prof. O. K. Bierkeland, the Norwegian physicist. Theoretically the device can throw a projectile weighing two tons a distance of 90 miles by sufficiently prolonging the tube. The projectile is expelled from an ordinary cast-iron tube, thickly wrapped with copper wire. This tube can, of course, be made more cheaply than the cannon now in use. The trials were so successful that a firm of artillery manufacturers offered to buy the invention for immediate exploitation, provided Prof. Bierkeland will increase the length of the piece so that it will throw a two-ton projectile twelve miles. Some experts believe the invention signifies a greater change in war material than was brought about by the introduction of gunpowder.

CRUSOE'S ISLAND RICH IN LOBSTERS.

Fish, Vegetables and Fruit Abound in the Land Made Famous by Daniel Defoe.

The Island of Juan Fernandez, owned by Chile, and made famous by Robinson Crusoe, promises to derive an equal amount of fame because of its lobsters. It is no wonder that Crusoe found so little trouble in making a living on the island, judging from reports of those who have recently visited the place. R. E. Mansfield, United States consul at Valparaiso, writes:

The lobsters are large, of excellent flavor, and especially suited for canning. They are easily caught, the supply seems inexhaustible and the cost of canning them is nominal. There are also large numbers of fur seals on Fernandez and other islands near by, the taking of which might be profitably included in the lobster and fish business. The laws of Chile permit the killing of seals from March 1 to November 1. There is a ready market for the seal skins in Valparaiso whence they are shipped to Europe. There is plenty of fresh water on the island; land can be acquired by settlers without cost; fruit and vegetables grow wild and are easily cultivated. I am of the opinion that an American company could engage in the fishing and canning business on the island with reasonable assurance of securing large profits. The island is about 15 miles long and 8 miles wide and there is a good harbor on one side where large ships can anchor safely.

England has discovered a new gold field. The main reef of the Rand reef has been found to extend into territory added to Natal.

It has been discovered that beriberi, the most fatal disease of the Orient, is caused by eating Chinese white rice.

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WANTS AMERICAN MACHINERY

Prince Pra Ong Chow Sai Sanitwongsee of China desires to establish a rice mill for making paddy to the amount of about 133,000 pounds of white rice per day; the machinery to be operated by electricity. He desires information from America as to the cost and kind of machinery. Correspondence will reach him through Mr. Hamilton King, United States consul general at Bangkok.

MAYBE IT WAS APPROPRIATE.

A Chinese cook, distinguished for making fine cakes, determined upon his masterpiece at a recent festive occasion at which his San Francisco mistress was to entertain a number of guests. He asked her if it would not be proper to have a motto to ornament the top of the cake. Smilingly she told him to finish the work any way he might think suitable. When the guests had assembled, these words adorned the huge loaf of pastry: "Prepare to Meet thy God."

ANCIENT ENGLISH CHAIR FOUND.

An old oaken chair, which is said to be the most perfect specimen of ancient British carpentry extant, has been found by Dr. James Johnson in the village church at Stanford Bishop, Eng. It is believed to have been used by St. Augustine at the synods held between A. D. 590 and 603. The chair is made entirely of wood without any form of iron work.

EIFFEL TOWER SWAYED FOUR INCHES.

The top of Eiffel tower swayed four inches during a wind of 71 miles an hour, according to measurements made by an ingenius method suggested by its builder, M. G. Eiffel. The general effect of the wind was to make the top of the tower describe an ellipse.

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NEWSDEALERS
SUPPLIED WITH THIS PAPER BY AMERICAN AND WESTERN NEWS CO.'S BRANCHES

Attractions for Next Week.

Everybody has opinions, but it is not everybody whose opinion is worthy of credence. Did you ever notice the authority Popular Mechanics quotes? Men, whose success has added to the fame of the nation, the heads of great mechanical and industrial institutions advise Popular Mechanics readers on topics that are of vital importance to every person who is striving for advancement. You have read in this issue of "How Volcanoes are Caused," by Prof. Shaler of Harvard University. There are other articles from men just as great who do not wish their names used. Next week the superintendent of the Baldwin Locomotive Works will talk on the subject of Manual Training Schools; Thomas A. Edison will tell about what Santos Dumont ought to do to make his air ship a success; American consuls in foreign lands will tell of conditions there and opportunities for American investors.

Water is a mighty good thing but people can use too much. There is the city of Buffalo, for instance, where the people use four barrels apiece every day. Read about it next week.

It is not uncommon for a fire company to make a run to a fire, but for a fire to make a run to a fire station to have itself put out beats the record. Such a thing happened not long ago and we will tell about it next week.

Kitchens in fashionable homes may soon go out of style. Now they have automobile kitchens that go from house to house and serve the meals as previously ordered. The next issue will also tell about how the men who operate torpedo boats, and not the enemy, are the ones that are more liable to be blown to eternity; a device that a farmer or gardener may make and set in his field to catch all the insects; the great wealth of Krupp, who owns the Krupp guns and how "the little Kingdom of Krupp" has grown from nothing to 200,000 population. The score of other interesting things that will appear are all "written so you can understand them."

HELP WANTED.

CORNICE MAKERS—C. B. Smith, King and 4th av., So., Seattle, Wash.

SALESMAN—Arc cluster gas lamps. 56 5th av., Room 404, Chicago, Ill.

MACHINE SHAVERS—Pfister & Vogel Leather Co., Milwaukee, Wis.

MACHINISTS—Superior Iron Works, West Superior, Wis.

PAINTER—John C. Barton & Co., Minneapolis, Minn.

PLUMBERS. H. L. Burns, Spokane, Wash.

COMMERCIAL ARTISTS. Woodward & Tiernan Printing Co., St. Louis, Mo.

FACTORY HANDS. American Can Co., Maywood, Ill.

VULCAN Steam Shovel operator. Box 746, Atlanta, Ga.

PLUMBERS—THREE UNION. H. L. Burns, Spokane, Wash.

PATTERNMAKERS. The Balkwill Pattern Works, 970 Hamilton street, Cleveland, Ohio.

TOP BUILDER, seat trimmer. Laporte Carriage Co., Laporte, Ind.

BUSHELMEN—Six. Ed. W. Price, 185 E. Van Buren St., Chicago, Ill.

CUTTERS AND GLAZIERS—Two, Kansas City Stained Glass Works, Kansas City, Mo.

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